

CHANGES TO CIRCULARS DEQ-1 AND DEQ-3  
IN RESPONSE TO COMMENTS RECEIVED REGARDING  
MAR NOTICE NO. 17-234

DEQ-1 Standard 1.1.6 Flow requirements, including:

- a. hydraulic analyses based on flow demands and pressure requirements (See Section 8.2.1), and
- b. fire flows, when fire protection is provided, meeting the recommendations of the ~~appropriate fire authority (State Fire Marshal, Insurance Services Office or Local Fire Department) or other similar agency for the service area involved~~ fire protection agency in which the water system is being developed, or in the absence of such a recommendation, the fire code adopted by the State of Montana. Documentation from the ~~appropriate fire authority~~ fire protection agency may be required if the flow requirements vary significantly from typical values.

DEQ-1 Standard 3.1.1 Quantity

The quantity of water at the source must

- a. be adequate to meet or exceed the design maximum day demand for the service area as shown by calculations based on a one in fifty year drought or the extreme drought of record, and must include consideration of multiple year droughts. Storage must comply with the provisions of Section 7.0.1 or Section 7.2.2, as appropriate. Requirements for flows downstream of the inlet must comply with the requirements of the appropriate reviewing authority,
- b. provide a reasonable surplus for anticipated growth,
- c. be adequate to compensate for all losses such as silting, evaporation, seepage, etc., and
- d. be adequate to provide ample water for other legal users of the source.

DEQ-1, Standard 3.2.1.1 Source capacity

- a. The total developed groundwater source capacity for systems utilizing gravity storage or pumped storage, unless otherwise specified by MDEQ must equal or exceed the design maximum day demand with the largest producing well out of service. Storage must comply with the requirements of Section 7.0.1. ~~Adequate storage per section~~

~~7.0.1.b will be required if source capacity is inadequate to meet peak instantaneous demand.~~

- b. The total developed groundwater source capacity for systems utilizing hydropneumatic storage tanks as the only storage facility must be sufficient to equal or exceed the peak instantaneous demand with the largest producing well out of service. For systems serving 50 or less equivalent dwelling units, MDEQ may allow a reduction in total required system capacity provided the system can maintain the minimum pressures required in section 8.2.1 with the largest producing well out of service.

DEQ-1, Standard 3.2.5.2 Minimum protected depths

- a. Minimum protected depths of drilled wells must provide watertight construction to such depth as may be required by MDEQ, to
  - 1. exclude contamination, and
  - 2. seal off formations that are, or may be, contaminated or yield undesirable water.
- b. Wells must have unperforated casing to a minimum depth of 25 feet or continuous disinfection with chlorine must be provided.
- c. Full time disinfection ~~with chlorine~~ is required where the water source is an aquifer with a water table that is within 25 feet of the ground surface. A deviation of this standard may be granted by MDEQ in accordance with the procedures of Section 1.7.

DEQ-1, Standard 7.0.1 Sizing

Storage facilities must be ~~have~~ sufficient capacity, as determined from engineering studies, to supplement source capacity to satisfy all system meet maximum daily demands occurring on the maximum day, plus fire flow demands, and where fire protection is provided, ~~fire flow demands~~.

- a. Fire flow requirements ~~established by the appropriate fire authority (State Fire Marshal, Insurance Services Office, or Local Fire Department)~~ recommended by the fire protection agency in which the water system is being developed, or in the absence of such a recommendation, the fire code adopted by the State of Montana, must be satisfied where fire protection is provided.
- b. The minimum allowable storage capacity ~~(or equivalent capacity)~~ must be equal to the average daily demand for a 24-hour period consumption plus required fire flow demand ~~protection storage volume (flowrate times duration)~~ where fire protection is provided. This requirement may

~~be reduced when the source and treatment facilities have sufficient capacity with standby power to supplement peak demands of the system. Any reduction in storage must be supported by detailed engineering studies that include accurate water usage data and extended time reservoir mass flow analysis for the maximum day demand with the required fire flow occurring during the peak hours of the day. Any deviation requests from this standard must be supported by a Storage Sizing Engineering Analysis. Large non-residential demands must be accompanied by a Storage Sizing Engineering Analysis and may require additional storage to meet system demands.~~

c. Each pressure zone of systems with multiple pressure zones must be analyzed separately and provided with sufficient storage to satisfy the above requirements.

e. d. Excessive storage capacity should be avoided to prevent water quality deterioration and potential freezing problems.

#### DEQ-1, Standard 7.0.8 Access

Finished water storage structures must be designed with reasonably convenient access to the interior for cleaning and maintenance. At least two (2) ~~manholes~~ manways must be provided above the waterline at each water compartment where space permits.

#### DEQ-1, Standard 7.0.8.1 Elevated Storage Structures

At least one of the ~~manholes~~ manways:

- a. must be framed at least four inches above the surface of the roof at the opening,
- b. must be fitted with a solid watertight cover which overlaps the framed opening and extends down around the frame at least two inches,
- c. must be hinged at one side, and
- d. must have a locking device.

All other ~~manholes~~ manways or access ways must be bolted and gasketed, or must meet the requirements of (a-d).

#### DEQ-1, Standard 7.2.2 Sizing

- a. The capacity of the source(s) wells and pumps in a hydropneumatic system must have demand sufficient to satisfy the requirements in section 3.1.1. or 3.2.1.1.b.

#### DEQ-1, Standard 8.2.3 Fire protection

When fire protection is to be provided, system design must be such that fire flows and facilities are in accordance with the recommendations of the ~~appropriate fire authority (State Fire Marshal, Insurance Services Office, or Local Fire Department)~~ fire protection agency in which the water system is being developed, or in the absence of such a recommendation, the fire code adopted by the State of Montana. Water mains not designed to carry fire flows may not have fire hydrants connected to them.

#### DEQ-1, Standard 8.4.1 Location and spacing

Hydrants should be provided at each street intersection and at intermediate points between intersections and must be provided as recommended by ~~appropriate fire authority (State Fire Marshal, Insurance Services Office, or Local Fire Department)~~ the fire protection agency in which the water system is being developed, or in the absence of such a recommendation, the fire code adopted by the State of Montana. ~~Generally, hydrant spacing may range from 350 to 600 feet depending on the area being served.~~

#### DEQ-1 Standard 8.15 Temporary Water Distribution

All pipes including service lines and all appurtenances for the temporary distribution of water during construction of replacement projects must be approved by the MDEQ, ~~and must comply with the requirements of Chapter 8 where appropriate.~~ The plans and specifications must, at a minimum, satisfy the following requirements:

- a. All materials must comply with ANSI/NSF, where such standards exist, and be acceptable to MDEQ.
- b. No component of the temporary distribution system can be in contact with or at risk of being in contact with sources of contamination.
- c. The temporary system must be designed to maintain a minimum working pressure of 35-psi at all points in the distribution system including the service lines.
- d. Where accumulation of air could diminish the flow capacity of the system, air relief must be provided.

- e. All piping and valves must be adequately restrained where necessary and protected from physical damage to the extent practicable.
- f. Each temporary setup of distribution piping must be visually inspected for leaks at full pressure prior to use and daily during use. Visual leaks occurring during use must be reported to the project engineer and repaired immediately.
- g. Each temporary setup of distribution piping must be flushed, disinfected, and microbiologically tested in accordance with AWWA Standard C651.
- h. There may not be any potential cross-connections to the temporary distribution system.
- i. A double check assembly backflow prevention valve, at a minimum, must be installed to protect the municipal supply connection to the temporary distribution system. Backflow prevention valves must conform to standards issued by AWWA.

#### DEQ-1, Standard 8.2.2 Diameter

The minimum size of water main for providing fire protection and serving fire hydrants must be six-inch diameter. Larger size mains will be required if necessary to allow the withdrawal of the required fire flow while maintaining the minimum residual pressure specified in Section 8.2.1.

The minimum size of water main in the distribution system where fire protection is not to be provided ~~must~~ should be a minimum of three-inch diameter. Any departure from minimum requirements must be justified by hydraulic analysis and future water use, and can be considered only in special circumstances.

DEQ-1, Glossary: Fire-flow Demand: Volume of water required to fight structural fires, expressed as flow rate times duration. ~~The State Fire Marshal, Insurance Services Office, or Local Fire Department must concur with the proposed fire flows~~ must be as recommended by the fire protection agency in which the water system is being developed, or in the absence of such a recommendation, the fire code adopted by the State of Montana. Fire flow demand must be added to the maximum day demand during the hours of peak demand when designing a system.

Storage Sizing Engineering Analysis: A detailed engineering study that includes hourly water usage demands for the maximum day, operational storage volume requirements, reserve standby storage requirements, dead storage volume, and extended time reservoir mass flow analysis for the maximum day demand with the required fire flow, when fire protection is provided, occurring during the hours

of peak demand. The required design storage volume must be determined with the largest well, largest treatment train, and largest booster pump out of service and must include provisions for auxiliary power.

DEQ-3 Standard 3.2.1.2 Water use estimates for design purposes

- a. Domestic use - 100 gpcd must be provided for average domestic use unless the designer has sufficient data, acceptable to MDEQ, to show a lesser quantity to be adequate.
- b. Irrigation - when irrigation water is provided, information must be submitted to show that adequate water will be available. Such information must include:
  - 1. the area to be irrigated in acres or square feet,
  - 2. water requirements in inches/week,
  - 3. proposed methods of controlling irrigation beyond the capacity of the system.
- c. Fire flows - fire flows must meet the recommendations of the ~~appropriate fire authority (State Fire Marshal, Insurance Services Office or Local Fire Department) where applicable~~ fire protection agency in which the water system is being developed, or in the absence of such a recommendation, the fire code adopted by the State of Montana.

DEQ-3, Standard 3.2.5.1 Minimum protected depths.

- a. Wells must have unperforated casing to a minimum depth of 25 feet or continuous disinfection must be provided.
- b. Full time disinfection ~~with chlorine~~ is required where the water source is an aquifer with a water table that is within 25 feet of ground surface. A deviation of this standard may be granted by MDEQ in accordance with the procedures of Section 1.4.